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EXAMINER	
SANDERS, AARON J	

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2168	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/800,493	Applicant(s) SHELDON ET AL.	
	Examiner AARON SANDERS	Art Unit 2168	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 05 February 2008.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1,7-15,21-29 and 35-42 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1,7-15,21-29 and 35-42 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 15 March 2004 is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Applicant's amendment filed 5 February 2008 has been entered. Claims 1, 7-15, 21-29, and 35-42 are pending. Claims 1, 15, and 29 are amended. Claims 2-6, 16-20, and 30-34 are cancelled. This action is FINAL, as necessitated by amendment.

Drawings

Fig. 11B is objected to because both outputs of decision block 1134 are "Y," while the specification, see [0040], states that if "L" is not zero, go to block 1138.

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the method of the independent claims must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet"

pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

As per claim 1, the phrase "performing expression optimization the expression" is incorrect. It appears that it should be "performing expression optimization <u>on</u> the expression."

As per claim 15, the limitation "one or more of the expressions" lacks antecedent basis in the claim. It appears that it should be "the expression."

Claim Rejections - 35 USC § 112, First Paragraph

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1, 15, and 29 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Specifically, the limitations "performing further query optimization <u>to produce a result</u>" and "saving the result in a memory" do not appear in the specification.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1, 7-15, 21-29, and 35-42 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

The disclosed subject matter lacks a practical application of a judicial exception (law of nature, abstract idea, naturally occurring article/phenomena) since it fails to produce a tangible result.

Specifically, the disclosed subject matter does not produce a tangible result because it fails to produce a result that is limited to having real world value rather than a result that may be interpreted to be abstract in nature as, for example, a thought, a computation, or manipulation of data. More specifically, the disclosed subject matter provides for performing further query optimization, such as determining one or more plans for executing the query and selecting an optimal plan from executing the database query. This produced result remains in the abstract because it is not clear that “determining” or “selecting” generates any output to another user or system. Thus, the result fails to achieve the required status of having real world value.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 7-9, 11-13, 15, 21-23, 25-27, 29, 35-37, and 39-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Paulley et al., U.S. 6,665,664 (Paulley), in view of Warner et al., U.S. 2005/0055338 (Warner).

1. Paulley teaches "A method of processing a database query, the query including an expression, the method including," see col. 1, lines 27-31, "information processing environments and, more particularly, to computer-implemented methodologies for query optimization."

Paulley teaches "performing expression optimization the expression," see col. 7, lines 42-55, "a preprocessing phase, in which expressions are simplified whenever possible."

Paulley teaches "performing further query optimization to produce a result," see col. 7, lines 42-55, "a normalization phase, in which the simplified expression is analyzed and either fully converted to conjunctive normal form."

Paulley teaches "saving the result in a memory," see col. 8, lines 5-13, "the normalization method of the present invention saves only the useful prime implicates it can derive from the original input."

Paulley teaches "performing expression optimization before further query optimization," see col. 7, lines 42-55, "This preprocessing phase includes several steps that are designed to simplify the original query expression, thereby simplifying the matrix processing occurring in the normalization phase."

Paulley teaches "and where the expression includes a sub-expression ("SE")," see col. 13, lines 1-13, "The present invention repeatedly generates prime implicates of disjunctive sub-

expressions nested within a conjunctive expression, thereby normalizing the search condition piece-by-piece."

Paulley teaches "and where the expression optimization includes: representing the query as a tree structure," see col. 11, lines 56-65, "the SQL statements are passed to the parser 361 which converts the statements into a query tree."

Paulley teaches "representing the expression in the tree structure as a parent node having a first child node and a second child node," see col. 11, lines 56-65, "the SQL statements are passed to the parser 361 which converts the statements into a query tree – a binary tree data structure which represents the components of the query."

Paulley does not teach "where the first child node represents the sub-expression." Warner does, however, see Fig. 1 and [0005], "Drilling down lower into this expression tree, it can be seen that branching into node 104 from the left side is the child node 108 representing the 'A' value," where it is obvious that the referenced node "A" could be a "sub-expression." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Warner's teachings would have allowed Paulley's method and system to gain a standard means for representing expressions, see [0005].

Paulley does not teach "where the second child node represents the portion of the expression that is not the sub-expression." Warner does, however, see Fig. 1 and [0005], "Branching into the node 104 from the right side is the child node 110 representing the 'B' value," where the referenced node "B" is "not the sub-expression." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the

teachings of the cited references because Warner's teachings would have allowed Paulley's method and system to gain a standard means for representing expressions, see [0005].

Paulley does not teach "and where the parent node represents an operation between the first child node and the second child node." Warner does, however, see Fig. 1 and [0005], "Extending into node 102 from the left side is the output from the child node 104 representing the '+' operator," where the claimed "parent node" is the referenced "node 104." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Warner's teachings would have allowed Paulley's method and system to gain a standard means for representing expressions, see [0005].

Paulley does not teach "determining that the second child node represents the constant 0 and that the parent node represents an arithmetic operation selected from the group consisting of addition and subtraction." Warner does, however, see Fig. 1 and [0005], "Extending into node 102 from the left side is the output from the child node 104 representing the '+' operator… Branching into the node 104 from the right side is the child node 110 representing the 'B' value," where it is obvious that the referenced "B" could have the value "0." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Warner's teachings would have allowed Paulley's method and system to gain a standard means for representing expressions, see [0005].

Paulley does not teach "and in response, removing the parent node and its children from the tree structure and inserting the first child node in its place." Warner does, however, see Fig. 1 and [0006], "The intermediate result from the operator at node 104 is propagated upwards to be evaluated by the operator at node 102 along with the input from 106." Thus, it would have been

obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Warner's teachings would have allowed Paulley's method and system to gain a standard means for representing expressions, see [0005].

7. Paulley teaches "The method of claim l, where the query includes an assignment list clause and where one or more of the expressions are in the assignment list clause," see col. 18, lines 37-54, "A linked list of pointers is used to track which branches in the expression tree should be converted."

8. Paulley teaches "The method of claim 1, where the query includes a WHERE clause, and where one or more of the expressions are in the WHERE clause," see col. 2, Table 1, "SELECT name FROM employees WHERE sal=l 0,000."

9. Paulley teaches "The method of claim 1, where further query optimization includes: determining a satisfiability of the database query," see col. 2, lines 55-63, "Conjunctive conditions are useful because they must each evaluate to true in order for the query's Where clause to be satisfied."

11. Paulley teaches "The method of claim 1, where further query optimization includes: determining one or more plans for executing the query," see col. 2, lines 37-54, "a component called the optimizer determines the 'plan' or the best method of accessing the data to implement the SQL query."

12. Paulley teaches "The method of claim 11, where one of the one or more plans includes: scanning a table to locate rows that satisfy one or more conditions; and summing one or more columns in the rows that satisfy the one or more conditions," see col. 4, lines 11-43, "The usefulness of converting the search conditions to conjunctive normal form is that for a clause that

consists of only a single predicate (i.e., not ‘ORed with anything’), for any row in the result of that query that predicate must be true” where then summing the columns would have the same “true” result.

13. Paulley teaches “The method of claim 1, where further query optimization includes: selecting an optimal plan from executing the database query,” see col. 12, lines 7-16, “The optimizer, therefore, performs an analysis of the query and picks the best execution plan, which in turn results in particular ones of the access methods being invoked during query execution.”

15. Paulley teaches “A computer program, stored on a tangible storage medium, for use in processing a database query, the query including an expression, the computer program including executable instructions that cause a computer to,” see col. 1, lines 27-31, “information processing environments and, more particularly, to computer-implemented methodologies for query optimization.”

Paulley teaches “perform expression optimization on one or more of the expressions,” see col. 7, lines 42-55, “a preprocessing phase, in which expressions are simplified whenever possible.”

Paulley teaches “perform further query optimization to produce a result,” see col. 7, lines 42-55, “a normalization phase, in which the simplified expression is analyzed and either fully converted to conjunctive normal form.”

Paulley teaches “save the result in a memory,” see col. 8, lines 5-13, “the normalization method of the present invention saves only the useful prime implicates it can derive from the original input.”

Paulley teaches "where the expression includes a sub-expression ("SE")," see col. 13, lines 1-13, "The present invention repeatedly generates prime implicates of disjunctive sub-expressions nested within a conjunctive expression, thereby normalizing the search condition piece-by-piece."

Paulley teaches "where expression optimization is performed before further query optimization," see col. 7, lines 42-55, "This preprocessing phase includes several steps that are designed to simplify the original query expression, thereby simplifying the matrix processing occurring in the normalization phase."

Paulley teaches "and where the computer program includes executable instructions that cause a computer to: represent the query as a tree structure," see col. 11, lines 56-65, "the SQL statements are passed to the parser 361 which converts the statements into a query tree."

Paulley teaches "represent the expression in the tree structure as a parent node having a first child node and a second child node," see col. 11, lines 56-65, "the SQL statements are passed to the parser 361 which converts the statements into a query tree – a binary tree data structure which represents the components of the query."

Paulley does not teach "where the first child node represents the sub-expression." Warner does, however, see Fig. 1 and [0005], "Drilling down lower into this expression tree, it can be seen that branching into node 104 from the left side is the child node 108 representing the 'A' value," where it is obvious that the referenced node "A" could be a "sub-expression." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Warner's teachings would have allowed Paulley's method and system to gain a standard means for representing expressions, see [0005].

Paulley does not teach “where the second child node represents the portion of the expression that is not the sub-expression.” Warner does, however, see Fig. 1 and [0005], “Branching into the node 104 from the right side is the child node 110 representing the ‘B’ value,” where the referenced node “B” is “not the sub-expression.” Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Warner’s teachings would have allowed Paulley’s method and system to gain a standard means for representing expressions, see [0005].

Paulley does not teach “and where the parent node represents an operation between the first child node and the second child node.” Warner does, however, see Fig. 1 and [0005], “Extending into node 102 from the left side is the output from the child node 104 representing the ‘+’ operator,” where the claimed “parent node” is the referenced “node 104.” Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Warner’s teachings would have allowed Paulley’s method and system to gain a standard means for representing expressions, see [0005].

Paulley does not teach “determine that the second child node represents the constant 0 and that the parent node represents an arithmetic operation selected from the group consisting of addition and subtraction.” Warner does, however, see Fig. 1 and [0005], “Extending into node 102 from the left side is the output from the child node 104 representing the ‘+’ operator… Branching into the node 104 from the right side is the child node 110 representing the ‘B’ value,” where it is obvious that the referenced “B” could have the value “0.” Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the

teachings of the cited references because Warner's teachings would have allowed Paulley's method and system to gain a standard means for representing expressions, see [0005].

Paulley does not teach "and in response, remove the parent node and its children from the tree structure and insert the first child node in its place." Warner does, however, see Fig. 1 and [0006], "The intermediate result from the operator at node 104 is propagated upwards to be evaluated by the operator at node 102 along with the input from 106." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Warner's teachings would have allowed Paulley's method and system to gain a standard means for representing expressions, see [0005].

21. Paulley teaches "The computer program of claim l5, where the query includes an assignment list clause and where one or more of the expressions are in the assignment list clause," see col. 18, lines 37-54, "A linked list of pointers is used to track which branches in the expression tree should be converted."

22. Paulley teaches "The computer program of claim 15, where the query includes a WHERE clause, and where one or more of the expressions are in the WHERE clause," see col. 2, Table 1, "SELECT name FROM employees WHERE sal=l 0,000."

23. Paulley teaches "The computer program of claim 15, where further query optimization includes: determining a satisfiability of the database query," see col. 2, lines 55-63, "Conjunctive conditions are useful because they must each evaluate to true in order for the query's Where clause to be satisfied."

25. Paulley teaches "The computer program of claim 15, where further query optimization includes: determining one or more plans for executing the query," col. 2, lines 37-

54, “a component called the optimizer determines the ‘plan’ or the best method of accessing the data to implement the SQL query.”

26. Paulley teaches “The computer program of claim 25, where one of the one or more plans includes: scanning a table to locate rows that satisfy one or more conditions; and summing one or more columns in the rows that satisfy the one or more conditions,” see col. 4, lines 11-43, “The usefulness of converting the search conditions to conjunctive normal form is that for a clause that consists of only a single predicate (i.e., not ‘ORed with anything’), for any row in the result of that query that predicate must be true” where then summing the columns would have the same “true” result.

27. Paulley teaches “The computer program of claim 15, where further query optimization includes: selecting an optimal plan from executing the database query,” see col. 12, lines 7-16, “The optimizer, therefore, performs an analysis of the query and picks the best execution plan, which in turn results in particular ones of the access methods being invoked during query execution.”

29. Paulley teaches “A database system including: a massively parallel processing system including,” see Fig. 3.

Paulley teaches “one or more nodes,” see Fig. 3.

Paulley teaches “a plurality of CPUs, each of the one or more nodes providing access to one or more CPUs,” see Fig. 3.

Paulley teaches “a plurality of data storage facilities each of the one or more CPUs providing access to one or more data storage facilities,” see Fig. 3.

Paulley teaches “a process for execution on the massively parallel processing system for processing a database query, the query including an expression, the process including,” see col. 1, lines 27-31, “information processing environments and, more particularly, to computer-implemented methodologies for query optimization.”

Paulley teaches “performing expression optimization on the expression,” see col. 7, lines 42-55, “a preprocessing phase, in which expressions are simplified whenever possible.”

Paulley teaches “performing further query optimization to produce a result,” see col. 7, lines 42-55, “a normalization phase, in which the simplified expression is analyzed and either fully converted to conjunctive normal form.”

Paulley teaches “saving the result in a memory,” see col. 8, lines 5-13, “the normalization method of the present invention saves only the useful prime implicates it can derive from the original input.”

Paulley teaches “where the expression optimization is performed before the further query optimization,” see col. 7, lines 42-55, “This preprocessing phase includes several steps that are designed to simplify the original query expression, thereby simplifying the matrix processing occurring in the normalization phase.”

Paulley teaches “and where the expression includes a sub-expressions (“SE”) ,” see col. 13, lines 1-13, “The present invention repeatedly generates prime implicates of disjunctive sub-expressions nested within a conjunctive expression, thereby normalizing the search condition piece-by-piece.”

Paulley teaches "and where expression optimization includes: representing the query as a tree structure," see col. 11, lines 56-65, "the SQL statements are passed to the parser 361 which converts the statements into a query tree."

Paulley teaches "representing the expression in the tree structure as a parent node having a first child node and a second child node," see col. 11, lines 56-65, "the SQL statements are passed to the parser 361 which converts the statements into a query tree – a binary tree data structure which represents the components of the query."

Paulley does not teach "where the first child node represents the sub-expression." Warner does, however, see Fig. 1 and [0005], "Drilling down lower into this expression tree, it can be seen that branching into node 104 from the left side is the child node 108 representing the 'A' value," where it is obvious that the referenced node "A" could be a "sub-expression." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Warner's teachings would have allowed Paulley's method and system to gain a standard means for representing expressions, see [0005].

Paulley does not teach "where the second child node represents the portion of the expression that is not the sub-expression." Warner does, however, see Fig. 1 and [0005], "Branching into the node 104 from the right side is the child node 110 representing the 'B' value," where the referenced node "B" is "not the sub-expression." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Warner's teachings would have allowed Paulley's method and system to gain a standard means for representing expressions, see [0005].

Paulley does not teach “and where the parent node represents an operation between the first child node and the second child node.” Warner does, however, see Fig. 1 and [0005], “Extending into node 102 from the left side is the output from the child node 104 representing the ‘+’ operator,” where the claimed “parent node” is the referenced “node 104.” Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Warner’s teachings would have allowed Paulley’s method and system to gain a standard means for representing expressions, see [0005].

Paulley does not teach “determining that the second child node represents the constant 0 and that the parent node represents an arithmetic operation selected from the group consisting of addition and subtraction.” Warner does, however, see Fig. 1 and [0005], “Extending into node 102 from the left side is the output from the child node 104 representing the ‘+’ operator… Branching into the node 104 from the right side is the child node 110 representing the ‘B’ value,” where it is obvious that the referenced “B” could have the value “0.” Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Warner’s teachings would have allowed Paulley’s method and system to gain a standard means for representing expressions, see [0005].

Paulley does not teach “and in response, removing the parent node and its children from the tree structure and inserting the first child node in its place.” Warner does, however, see Fig. 1 and [0006], “The intermediate result from the operator at node 104 is propagated upwards to be evaluated by the operator at node 102 along with the input from 106.” Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the

teachings of the cited references because Warner's teachings would have allowed Paulley's method and system to gain a standard means for representing expressions, see [0005].

35. Paulley teaches "The database system of claim 29, where the query includes an assignment list clause and where one or more of the expressions are in the assignment list clause," see col. 18, lines 37-54, "A linked list of pointers is used to track which branches in the expression tree should be converted."

36. Paulley teaches "The database system of claim 29, where the query includes a WHERE clause, and where one or more of the expressions are in the WHERE clause," see col. 2, Table 1, "SELECT name FROM employees WHERE sal=l 0,000."

37. Paulley teaches "The database system of claim 29, where further query optimization includes: determining a satisfiability of the database query," see col. 2, lines 55-63, "Conjunctive conditions are useful because they must each evaluate to true in order for the query's Where clause to be satisfied."

39. Paulley teaches "The database system of claim 29, where further query optimization includes: determining one or more plans for executing the query," see col. 2, lines 37-54, "a component called the optimizer determines the 'plan' or the best method of accessing the data to implement the SQL query."

40. Paulley teaches "The database system of claim 39, where one of the one or more plans includes: scanning a table to locate rows that satisfy one or more conditions; and summing one or more columns in the rows that satisfy the one or more conditions," see col. 4, lines 11-43, "The usefulness of converting the search conditions to conjunctive normal form is that for a clause that consists of only a single predicate (i.e., not 'ORed with anything'), for any row in the

result of that query that predicate must be true" where then summing the columns would have the same "true" result.

41. Paulley teaches "The database system of claim 29, where further query optimization includes: selecting an optimal plan from executing the database query," see col. 12, lines 7-16, "The optimizer, therefore, performs an analysis of the query and picks the best execution plan, which in turn results in particular ones of the access methods being invoked during query execution").

Claims 10, 14, 24, 28, 38, and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Paulley et al., U.S. 6,665,664 (Paulley), in view of Esko Nuutila, "Transitive Closure," Helsinki University of Technology, 9 October 1995 (Nuutila).

10. Paulley does not teach "The method of claim 1, where further query optimization includes: determining a transitive closure of the database query." Nuutila does, however, see "The transitive closure of G is a graph G+ = (V,E+) such that for all v,w in V there is an edge (v,w) in E+ if and only if there is a non-null path from v to w in G." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Nuutila's teachings would have allowed Paulley's method and system to gain lower cost in executing queries on a database, see Nuutila, "It is required, for instance, in the reachability analysis of transition networks representing distributed and parallel systems and in the construction of parsing automata in compiler construction."

14. Paulley teaches "The method of claim l, where further query optimization includes two or more optimizations selected from the group consisting of: determining a satisfiability of

the database query," see col. 2, lines 55-63, "Conjunctive conditions are useful because they must each evaluate to true in order for the query's Where clause to be satisfied."

Paulley teaches "determining one or more plans for executing the query," see col. 2, lines 37-54, "a component called the optimizer determines the 'plan' or the best method of accessing the data to implement the SQL query."

Paulley teaches "and selecting an optimal plan from executing the database query," see col. 12, lines 7-16, "The optimizer, therefore, performs an analysis of the query and picks the best execution plan, which in turn results in particular ones of the access methods being invoked during query execution."

Paulley does not teach "determining a transitive closure of the database query." Nuutila does, however, see "The transitive closure of G is a graph G+ = (V,E+) such that for all v,w in V there is an edge (v,w) in E+ if and only if there is a non-null path from v to w in G." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Nuutila's teachings would have allowed Paulley's method and system to gain lower cost in executing queries on a database, see Nuutila, "It is required, for instance, in the reachability analysis of transition networks representing distributed and parallel systems and in the construction of parsing automata in compiler construction."

24. Paulley does not teach "The computer program of claim 15, where further query optimization includes: determining a transitive closure of the database query." Nuutila does, however, see "The transitive closure of G is a graph G+ = (V,E+) such that for all v,w in V there is an edge (v,w) in E+ if and only if there is a non-null path from v to w in G." Thus, it would

have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Nuutila's teachings would have allowed Paulley's method and system to gain lower cost in executing queries on a database, see Nuutila, "It is required, for instance, in the reachability analysis of transition networks representing distributed and parallel systems and in the construction of parsing automata in compiler construction."

28. Paulley teaches "The computer program of claim 15, where further query optimization includes two or more optimizations selected from the group consisting of: determining a satisfiability of the database query," see col. 2, lines 55-63, "Conjunctive conditions are useful because they must each evaluate to true in order for the query's Where clause to be satisfied."

Paulley teaches "determining one or more plans for executing the query," see col. 2, lines 37-54, "a component called the optimizer determines the 'plan' or the best method of accessing the data to implement the SQL query."

Paulley teaches "and selecting an optimal plan from executing the database query," see col. 12, lines 7-16, "The optimizer, therefore, performs an analysis of the query and picks the best execution plan, which in turn results in particular ones of the access methods being invoked during query execution."

Paulley does not teach "determining a transitive closure of the database query." Nuutila does, however, see "The transitive closure of G is a graph G+ = (V,E+) such that for all v,w in V there is an edge (v,w) in E+ if and only if there is a non-null path from v to w in G." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention

to combine the teachings of the cited references because Nuutila's teachings would have allowed Paulley's method and system to gain lower cost in executing queries on a database, see Nuutila, "It is required, for instance, in the reachability analysis of transition networks representing distributed and parallel systems and in the construction of parsing automata in compiler construction."

38. Paulley does not teach "The database system of claim 29, where further query optimization includes: determining a transitive closure of the database query." Nuutila does, however, see "The transitive closure of G is a graph G+ = (V,E+) such that for all v,w in V there is an edge (v,w) in E+ if and only if there is a non-null path from v to w in G." Thus, it would have been obvious to one of ordinary skill in the database art at the time of the invention to combine the teachings of the cited references because Nuutila's teachings would have allowed Paulley's method and system to gain lower cost in executing queries on a database, see Nuutila, "It is required, for instance, in the reachability analysis of transition networks representing distributed and parallel systems and in the construction of parsing automata in compiler construction."

42. Paulley teaches "The database system of claim 29, where further query optimization includes two or more optimizations selected from the group consisting of: determining a satisfiability of the database query," see col. 2, lines 55-63, "Conjunctive conditions are useful because they must each evaluate to true in order for the query's Where clause to be satisfied."

Paulley teaches "determining one or more plans for executing the query," see col. 2, lines 37-54, "a component called the optimizer determines the 'plan' or the best method of accessing the data to implement the SQL query."

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Response to Arguments

As per Applicant's argument that the drawings show the method of the independent claims, the Examiner respectfully disagrees. Referenced Fig. 1 does not show a method, and does not contain elements 320 and 325. Further, it is unclear which steps of Figs. 5-6 and 11A-12 correspond to at least the claim limitations "performing expression optimization," "performing further query optimization," "saving the result," "representing the query as a tree structure," and "representing the expression… as a parent node having… child node[s]."

As per Applicant’s arguments that the claims are statutory under 35 U.S.C. 101, the Examiner respectfully disagrees. The tangible result claimed, “saving the result,” does not appear in the specification. Further, the disclosed subject matter only provides for performing further query optimization, such as determining one or more plans for executing the query and selecting an optimal plan from executing the database query. This produced result remains in the abstract because it is not clear that “determining” or “selecting” generates any output to another user or system.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aaron Sanders whose telephone number is 571-270-1016. The examiner can normally be reached on M-F 9:00a-4:00p.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Vo can be reached on 571-272-3642. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tim T. Vo/
Supervisory Patent Examiner, Art Unit 2168

/Aaron Sanders/
Examiner, Art Unit 2168
21 April 2008

/S. P./
Primary Examiner, Art Unit 2164